

**AMENDMENTS TO THE CLAIMS**

Please amend claims 12, 19, 25 and 27-29 and 37-40, and add new claims 41-45. A complete listing of the claims, including their current status, is set forth below.

**1-11. (Cancelled)**

**12. (Currently amended)** A method for producing an insulin-producing cell *in vitro*, the method comprising:

introducing a nucleic acid molecule operably linked to a promoter into a **precursor** cell *in vitro*, the nucleic acid molecule encoding a neuroendocrine class B basic helix-loop-helix (bHLH) transcription factor, said introducing being in an amount sufficient for production of the neuroendocrine bHLH transcription factor and production of an insulin-producing cell;

wherein said **precursor** cell is **an embryonic stem cell or** a cultured gastrointestinal organ cell.

**13. (Previously presented)** The method of claim 12, wherein the neuroendocrine bHLH transcription factor is neurogenin3.

**14. (Withdrawn)** The method of claim 12, wherein the neuroendocrine bHLH transcription factor is a positive regulator of a neurogenin3 (Ngn3) regulatory pathway.

**15. (Cancelled)**

**16. (Withdrawn)** The method of claim 12, wherein the neuroendocrine bHLH transcription factor is neurogenin1, neurogenin2, NeuroD1/BETA2, neuroD2, math2, NeuroD4/Math3, math1/ATOH1, mash1/ASCL1/ASH1 or mash2.

**17. (Cancelled)**

**18. (Previously presented)** The method of claim 12, wherein the insulin-producing cell produced is an insulin-producing islet cell.

19. **(Currently amended)** A method for producing a mammalian insulin-producing cell *in vitro*, the method comprising the steps of:

introducing into a mammalian cell *in vitro* a nucleic acid molecule operably linked to a promoter, the nucleic acid molecule encoding a neuroendocrine class B bHLH transcription factor, wherein said introducing providing provides for expression of the transcription factor in the mammalian cell and production of insulin in the mammalian cell;

wherein said mammalian cell is ~~an embryonic stem cell or~~ a cultured gastrointestinal organ cell.

20. **(Original)** The method of claim 19, wherein the mammalian cell is a pancreatic cell.

21. **(Previously presented)** The method of claim 19, wherein the neuroendocrine bHLH transcription factor is neurogenin3.

22. **(Withdrawn)** The method of claim 19, wherein the neuroendocrine bHLH transcription factor is a positive regulator of a neurogenin3 (Ngn3) regulatory pathway.

23. **(Withdrawn)** The method of claim 19, wherein the neuroendocrine bHLH transcription factor is neurogenin1, neurogenin2, NeuroD1/BETA2, neuroD2, math2, NeuroD4/Math3, math1/ATOH1, mash1/ASCL1/ASH1 or mash2.

24. **(Cancelled)**

25. **(Currently amended)** A method for producing a mammalian insulin-producing cell *in vitro*, the method comprising the steps of:

introducing into a mammalian pancreatic cell *in vitro* a nucleic acid molecule the nucleic acid molecule being operably linked to a promoter, said nucleic acid molecule encoding neurogenin3 (Ngn3), wherein said introducing providing provides for expression of Ngn3 in the cell and production of insulin in the cell.

26. **(Cancelled)**

27. (**Currently amended**) A method for delivering insulin to the bloodstream of a mammalian subject, the method comprising:

introducing an insulin-producing cell produced by the method of claim 25 into a mammalian subject, wherein said introducing provides providing for production of insulin by the insulin-producing cell and delivery of insulin to the bloodstream of the mammalian subject.

28. (**Currently amended**) A method for delivering insulin to the bloodstream of a mammalian subject, the method comprising:

introducing an insulin-producing cell produced by the method of claim 12 into a mammalian subject, wherein said introducing provides providing for production of insulin by the insulin-producing cell and delivery of insulin to the bloodstream of the mammalian subject.

29. (**Currently amended**) A method for delivering insulin to the bloodstream of a mammalian subject, the method comprising:

introducing an insulin-producing cell produced by the method of claim 19 into a pancreas of a mammalian subject, wherein said introducing provides providing for production of insulin by the insulin-producing cell and delivery of insulin to the bloodstream of the mammalian subject.

30. (**Previously presented**) The method of claim 12, where the precursor cell is an adult pancreatic cell.

31-36. (**Cancelled**).

37. (**Currently Amended**) The method of claim 12, wherein said cultured gastrointestinal organ cell is pancreas cell.

38. (**Currently Amended**) The method of claim 19, wherein said cultured gastrointestinal organ cell is pancreas cell.

39. (Currently Amended) The method of claim 12, wherein said cultured gastrointestinal organ cell is a liver cell.

40. (Currently amended) The method of claim 19, wherein said cultured gastrointestinal organ cell is a liver cell.

41. (New) A method for producing insulin *in vitro*, comprising:

culturing a gastrointestinal organ cell *in vitro* to produce insulin, wherein said cell comprises a recombinant nucleic acid molecule comprising a nucleic acid molecule encoding a neuroendocrine class B basic helix-loop-helix (bHLH) transcription factor operably linked to a promoter.

42. (New) The method of claim 41, wherein the neuroendocrine bHLH transcription factor is neurogenin1, neurogenin2, NeuroD1/BETA2, neuroD2, math2, NeuroD4/Math3, math1/ATOH1, mash1/ASCL1/ASH1 or mash2.

43. (New) The method of claim 41, wherein said gastrointestinal organ cell is a pancreatic or liver cell.

44. (New) The method of claim 41, wherein said gastrointestinal organ cell is a gut or salivary gland cell.

45. (New) The method of claim 1, wherein said gastrointestinal organ cell is a gut or salivary gland cell.